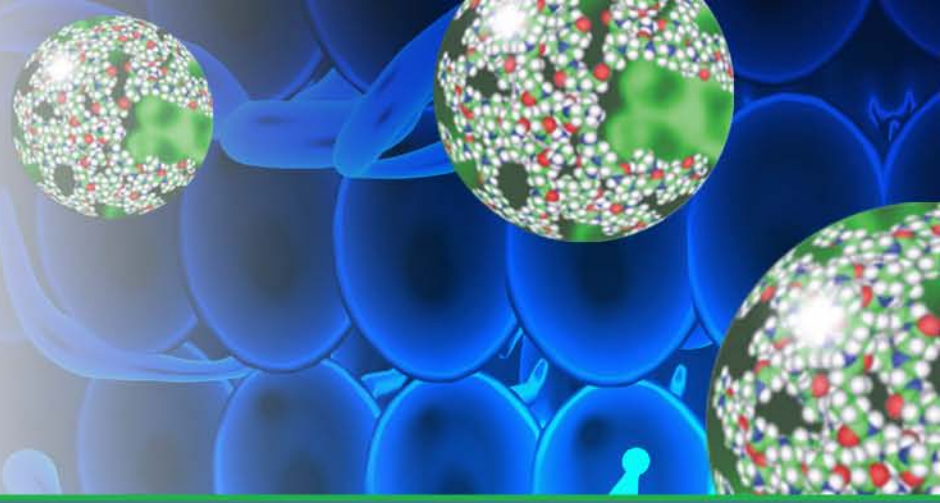
National Cancer Institute

NCI Alliance for Nanotechnology in Cancer



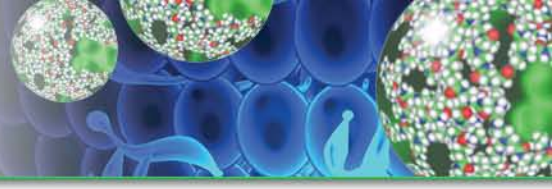
The Office of Cancer Nanotechnology Research Support and Resources for Cancer Nanotechnology Research

Dorothy Farrell, NCI

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health

NCI Alliance for Nanotechnology in Cancer



The Alliance aims to:

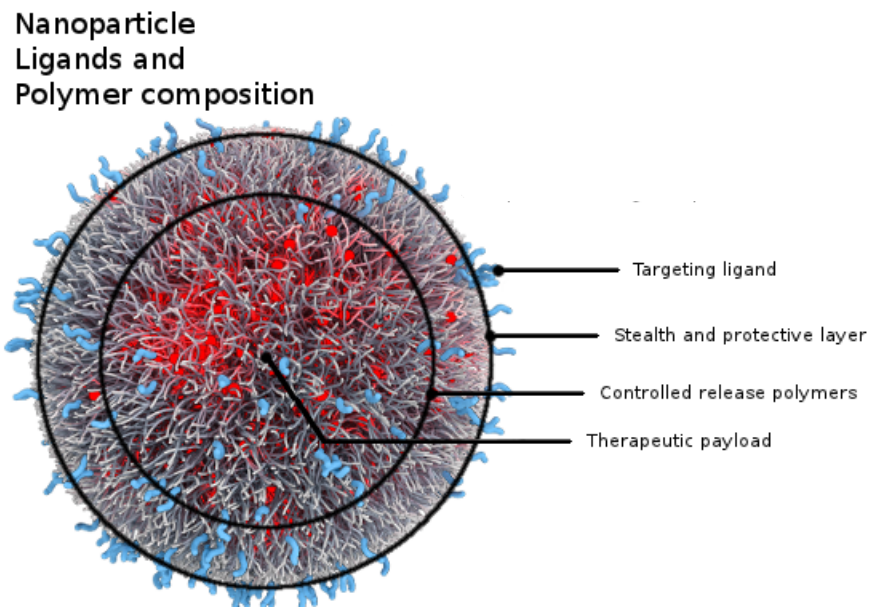
- Rapidly advance new nanotechnology discoveries into clinical practice
- Aid nanoparticle characterization and standardization of characterization methods
- Develop the next-generation of cancer researchers in the area of nanotechnology

The Alliance focuses on techniques and tools for:

- Multifunctional therapeutic solutions
- Early diagnosis using *in vitro* assays and devices
- *In vivo* imaging techniques

Nanoparticle Therapeutics

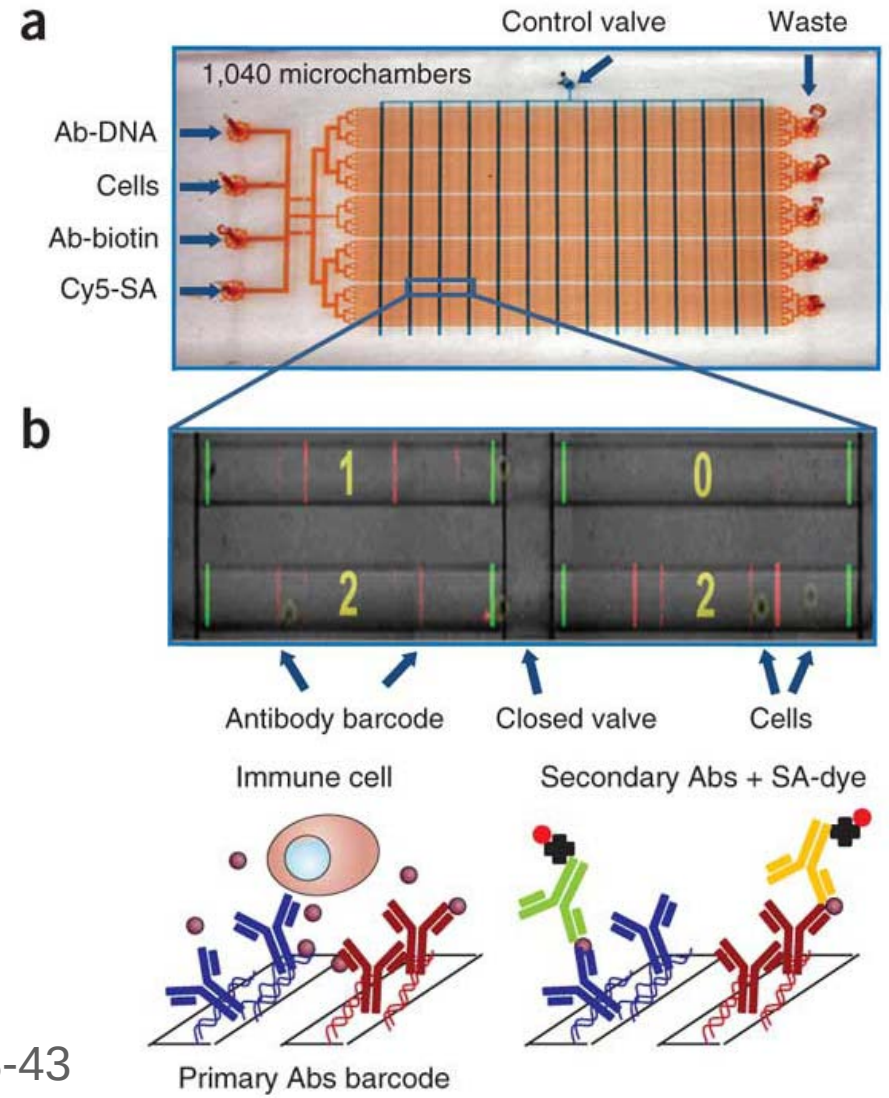
- Tumor microenvironment targeting
- Nanovehicles for drug delivery
  - Improved pharmacokinetics
- RNAi delivery
- Activation of targeted NPs
- New treatment modalities
  - Hyperthermia, laser ablation



BIND Biosciences

Nanotechnology & *In Vitro* Diagnostics

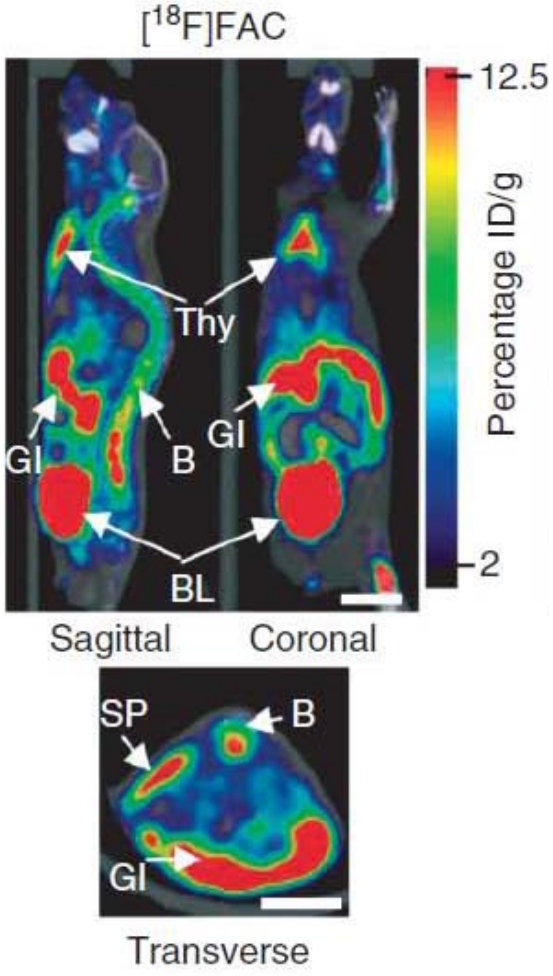
- Biomarker discovery
- Modular diagnostics
- Circulating tumor cells
- Multiplexed Detection
- Multifunctional detection



Nature Med 2011;17(6):738-43

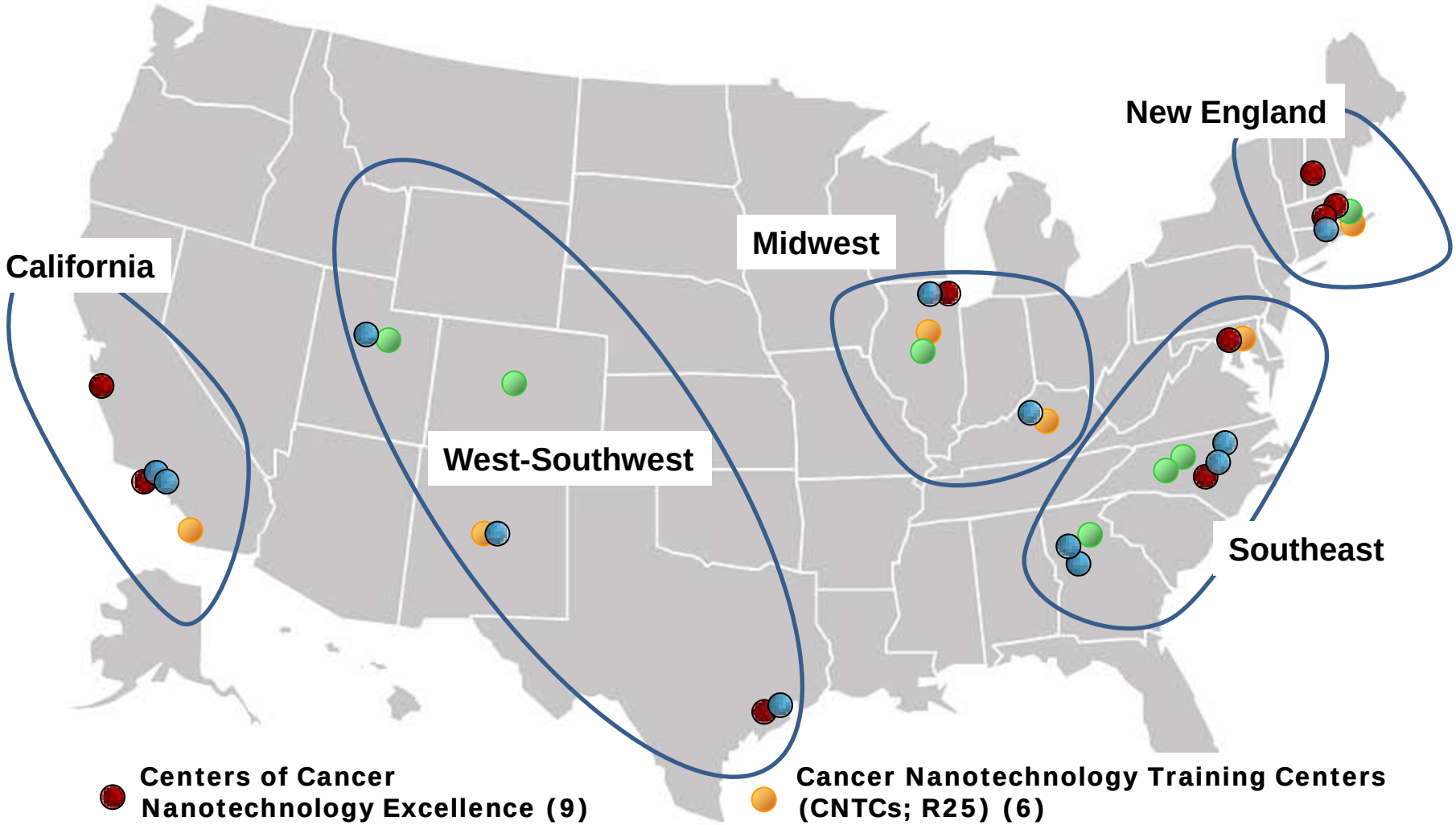
Nanotechnology & Imaging

- **Molecular imaging**
- **Diagnostic imaging**
  - Monitor response to therapy
- **Image-guided biopsies**
- **Intra-operative imaging**
- **Improved imaging hardware**
  - Carbon nanotube-based CT instruments



Nature Medicine (2008) 14: 783-788

Alliance Network



- Centers of Cancer Nanotechnology Excellence (9)
- Cancer Nanotechnology Training Centers (CNTCs; R25) (6)
- Cancer Nanotechnology Platform Partnerships (12)
- Pathway to Independence Award in Cancer Nanotechnology – K99/R00 (7)

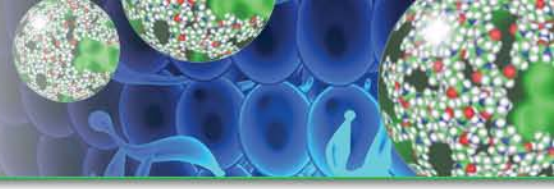
Dialog on Nanotechnology in Cancer

http://nano.cancer.gov/

https://nanocancer.ideascale.c

Post your ideas and comments by May 1st!

Translation Of Nanotechnology In Cancer: Consortium Partners



janssen | PHARMACEUTICAL COMPANIES OF Johnson & Johnson

Alamo Breast Cancer Foundation
San Antonio, Texas

AstraZeneca

MagArray

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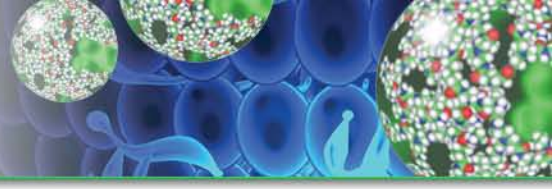
VERTEX

- **Advisory Committee**
  - **Joseph DeSimone (UNC), Robert Langer (MIT), Chad Mirkin (Northwestern U), Larry Tamarkin (Cytimmune), and Vladimir Torchilin (Northeastern U.)**

TONIC Activities



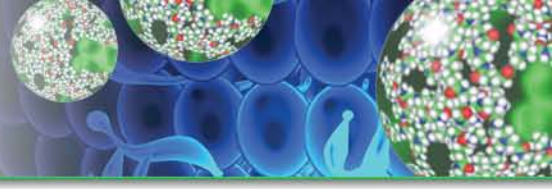
- Bringing Alliance research and TONIC members together

- Enhanced Permeability and Retention Workshop
  - Gathered leaders in tumor drug delivery, imaging and EPR
  - Identified models and tools needed to understand and advance nanomedicine drug delivery
  - Identify indications most likely to successfully exploit EPR
  - "Challenges and key considerations of the enhanced permeability and retention effect (EPR) for nanomedicine delivery in oncology," Cancer Research 2013 (published online February 19, 2013)

- Nanodrug Clinical Trial Working Group

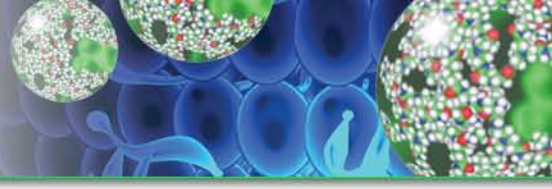
Federal Register / Vol. 76, No. 209 / Friday, October 28, 2011 / Notices

NCI Supports Standards and Best Practices in Nanotechnology



- NCL
  - Protocols and tutorials at http://ncl.cancer.gov/
  - Lessons Learned Workshops
  - "Common pitfalls in nanotechnology: lessons learned from NCI's Nanotechnology Characterization Laboratory," Integr Biol 2013;5(1):66-73
- Alliance Working Groups
  - "Biotargeted nanomedicines for cancer: six tenets before you begin, "Nanomedicine 2013;8(2):299-308
  - "Best practices in cancer nanotechnology: perspective from NCI Nanotechnology Alliance," Clin Cancer Res 2012;18:3229-41
  - Efforts in animal models and imaging
- National Nanotechnology Signature Initiatives
  - Nanotechnology for Sensors and Sensors for Nanotechnology
  - Nanotechnology Knowledge Infrastructure

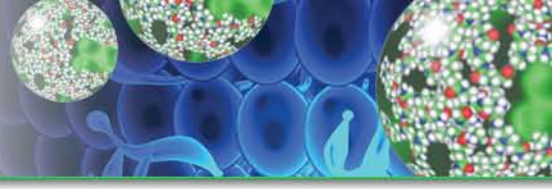
National Nanotechnology Initiative Signature Initiatives



- Nanotechnology for Sensors and Sensors for Nanotechnology: Improving and Protecting Health, Safety, and the Environment
  - This initiative supports all stages of the sensor development cycle, from funding decisions at the earliest stages, through regulatory review and guidance, post-market surveillance, and sensor deployment.

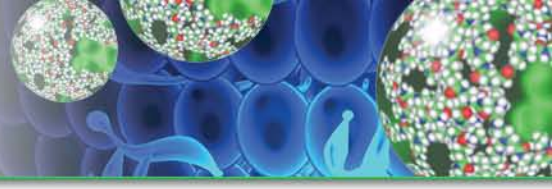
- Nanotechnology Knowledge Infrastructure
  - The NKI will enable national leadership in sustainable design, leverage and extend existing and emerging programs, resources and technologies and create an infrastructure to accelerate the vetting of new knowledge and to enable effective data utilization
  - NanoMaterial Registry: www.nanomaterialregistry.org

Symposia and Workshops



- AAPS National Biotechnology Conference
  - May 20-22 2013, San Diego CA
  - Nanotechnology platform-based biomarker assays symposium, 5/21
- Nanotech 2013, Washington, DC, May 2013
  - Cancer Nanotechnology and Signature Initiative Symposia
- Cancer Nanotechnology Gordon Research Conference
  - July 14-19, Mount Snow Resort VT
- Cancer Care for Engineers and Scientists
  - May 13-14, 2013, Boston University, http://nano-cancer.bu.edu/
  - Education on key concepts in clinical cancer care
- 2013 Bionanotechnology Summer Institute
  - July 29-August 9, 2013, University of Illinois Urbana-Champaign, http://nano.illinois.edu/BioNano2013/
  - Lectures and hands on training in engineering and physical sciences laboratory techniques

NCI Funding Opportunities



Nanoscience and Nanotechnology in Biology and Medicine (R01 or R21)

PA Number: PA-11-148/149
Application Receipt Date: June 5 or June 16, 2013

Cancer Diagnostic and Therapeutic Agents Enabled by Nanotechnology (SBIR U43/U44)

PA Number: PAR-10-286
Application Receipt Date: July 8, 2013

Early-Stage Innovative Molecular Analysis Technology Development for Cancer Research (R21)

RFA Number: RFA-CA-13-001
Application Receipt Date: May 20, 2013; September 20, 2013

Validation and Advanced Development of Emerging Molecular Analysis Technologies for Cancer Research (R33)

RFA Number: RFA-CA-13-002
Application Receipt Date: May 20, 2013; September 20, 2013

Research Answers to NCI's Provocative Questions- (R01) and (R21)

Group A generally relates to cancer prevention and risk

Group B mechanisms of tumor development or recurrence

Group C cancer detection, diagnosis, and prognosis

Group D cancer therapy and outcomes

Application Receipt Date: June 20, 2013

Office of Cancer Nanotechnology Research

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Stephanie Morris

Lynn Hull

Consultants:
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Uma Prabhakar – formerly J&J

http://www.nano.cancer.gov/